

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1-3. (Cancelled)

4. (Currently Amended) A process control system according to claim ~~[[2]]~~5, wherein~~[[:]]~~said control device ~~engages said transfer apparatus to transfer the workpiece at least having undergone the processing executed by said processing apparatus, to said measuring apparatus, compares a measurement value indicating the results of the processing executed on the workpiece, which is obtained through a measuring operation executed by said measuring apparatus on the workpiece at least having undergone the processing,~~ with a target value for the processing results, observes the state of a fluctuation in an error in the measurement value relative to the target value so as to predict the tendency of the fluctuation, and resets the processing condition for said processing apparatus in correspondence to the tendency of the fluctuation error before the error exceeds a predetermined value.

5. (Currently Amended) A process control system ~~according to claim 3,~~ wherein that controls processing executed on workpieces by, at least, one processing apparatus installed in each area in a factory, the processing results of which are predictable, comprising:

[[said]] at least one measuring apparatus that is installed for the corresponding area, executes a measuring operation on workpieces processed in the area, and includes a means for self-diagnosis that executes a diagnosis to determine whether or not an abnormality has occurred in said measuring apparatus;

a transfer apparatus provided for the corresponding area to transfer the workpieces among apparatuses which include said processing apparatus and said measuring apparatus in the area; and

a control device installed for the corresponding area to control said processing apparatus, said measuring apparatus and said transfer apparatus in the area, wherein said control device sets a processing condition for said processing apparatus based upon the results of a measuring operation executed by said measuring apparatus on workpieces processed by said processing apparatus,

engages said transfer apparatus to transfer the workpiece at least having undergone the processing executed by said processing apparatus to said measuring apparatus,

compares a measurement value indicating the results of the processing executed on the workpiece, which is obtained through a measuring operation executed by said measuring apparatus on the workpiece at least having undergone the processing, with a target value for the processing results,

engages said means for self-diagnosis at said measuring apparatus to execute a self-diagnosis if ~~[[the]]~~an error in the measurement value indicating the processing results relative to the target value is judged to be equal to or greater than a predetermined value, and resets the processing condition for said processing apparatus in correspondence to the error in the measurement value relative to the target value if the error is judged to be equal to or greater than a predetermined value, only if said measuring apparatus is determined to be error-free based upon the results of the self-diagnosis.

6. (Cancelled)

7. (Currently Amended) A process control system according to claim ~~[[6]]~~8, wherein~~[[:]]~~ said control device

engages said transfer apparatus to transfer the workpiece at least having undergone the processing executed by said processing apparatus to said measuring apparatus,  
compares a measurement value indicating the results of the processing executed on the workpiece obtained based upon the results of the measuring operation executed by said measuring apparatus on the workpiece at least having undergone the processing, which is obtained through a measuring operation executed by said measuring apparatus on the workpiece at least having undergone the processing, with the predictive value and

~~regenerates~~ re-ascertains the correlation if the error in the measurement value relative to the predictive value is judged to be equal to or greater than a predetermined value.

8. (Currently Amended) A process control system ~~according to claim 6,~~  
~~wherein:~~ that controls processing executed on workpieces by, at least, one processing apparatus installed in each area in a factory, the processing results of which are predictable, comprising:
- [[said]] at least one measuring apparatus that is installed for the corresponding area, executes a measuring operation on workpieces processed in the area, and includes a means for self-diagnosis that executes a diagnosis to determine whether or not an abnormality has occurred in said measuring apparatus;
- a transfer apparatus provided for the corresponding area to transfer the workpieces among apparatuses which include said processing apparatus and said measuring apparatus in the area; and
- a control device installed for the corresponding area to control said processing apparatus, said measuring apparatus and said transfer apparatus in the area, wherein said control device:
- sets a processing condition for said processing apparatus based upon the results of a measuring operation executed by said measuring apparatus on workpieces processed by said processing apparatus,

ascertains a correlation between operation data and processing result data by  
executing a multivariate analysis based upon the operation data related to  
an operation of said processing apparatus and the processing result data  
indicating the results of the processing executed by said processing  
apparatus,

obtains a predictive value that predicts the processing results based upon the  
correlation by using operation data obtained through processing executed  
on a workpiece other than the workpiece for which the correlation has  
been ascertained, and

engages said means for self-diagnosis at said measuring apparatus to  
execute a self-diagnosis if an error in the measurement value indicating  
the processing results relative to the predictive value is judged to be equal  
to or greater than a predetermined value and ~~regenerates~~ re-ascertains  
the correlation only if said measuring apparatus is determined to be error-  
free based upon the results of the self-diagnosis.

9. (Currently Amended) A process control system according to claim ~~[[6]]~~8,  
wherein~~[[:]]~~ said multivariate analysis is executed by adopting a PLS method.

10-11. (Cancelled)

12. (Currently Amended) A method of process control according to claim ~~[[10,]]~~13  
further comprising~~wherein:~~

~~the workpiece at least having undergone the processing is transferred by said~~  
~~transfer apparatus to said measuring apparatus, a measurement value~~  
~~indicating the results of the processing executed on the workpiece, which is~~  
~~obtained through a measuring operation executed by said measuring~~  
~~apparatus on the workpiece at least having undergone the processing, is~~  
~~compared with a target value for the processing results,~~  
predicting a tendency the state of a fluctuation of an error in the first workpiece  
~~measurement value relative to the target value is observed to predict a~~  
~~tendency based on an observation of the state of the fluctuation, and~~  
resetting the processing condition for said processing apparatus is reset in  
~~correspondence to the tendency of the fluctuation error before the error~~  
~~exceeds a predetermined value.~~

13. (Currently Amended) A method of process control ~~according to claim 11,~~  
~~wherein:~~ executed by a control device in each area in a process control system having  
installed in each area at least one processing apparatus, the processing results of which  
are predictable, at least one measuring apparatus, a transfer apparatus, and said  
control device that controls said processing apparatus, said measuring apparatus and  
said transfer apparatus, comprising the steps of:  
setting a processing condition for said processing apparatus used to process a  
first workpiece,

transferring the first workpiece at least having undergone the processing  
executed by said processing apparatus to said measuring apparatus by said  
transfer apparatus,  
obtaining a first workpiece measurement value that indicates the results of the  
processing executed on the first workpiece through a measuring operation  
executed by the measuring apparatus on the workpiece at least having  
undergone the processing,  
comparing said first workpiece measurement value with a processing result  
target value to determine an error in the measurement value relative to the  
target value,  
~~in said step in which the processing condition for said processing apparatus is~~  
~~reset, said measuring apparatus is engaged~~ engaging in a self-diagnosis  
operation if the error in the first workpiece measurement value indicating the  
processing results relative to the target value is determined to be equal to or  
greater than ~~[[the]]~~ a predetermined value, and  
resetting the processing condition for said processing apparatus in  
correspondence to the error, if the error is determined to be equal to or  
greater than the predetermined value ~~is reset~~ only if said measuring  
apparatus is judged to be error-free based upon the results of the self-  
diagnosis operation.

14-15. (Cancelled)

16. (Currently Amended) A method of process control ~~according to claim 15,~~  
~~wherein:~~executed by a control device in each area in a process control system having  
installed in each area at least one processing apparatus, the processing results of which  
are predictable, at least one measuring apparatus, a transfer apparatus, and said  
control device that controls said processing apparatus, said measuring apparatus and  
said transfer apparatus, the method comprising:

transferring a workpiece at least having undergone the processing executed by  
said processing apparatus to said measuring apparatus by said transfer  
apparatus,

executing a measuring operation by a measuring apparatus on a workpiece  
processed by said processing apparatus to obtain a measurement value  
indicating the results of the processing executed on the workpiece;

setting a processing condition for said processing apparatus based upon the  
results of the measuring operation executed by said measuring apparatus;

generating a correlation between operation data obtained from said processing  
apparatus and processing result data indicating the results of the processing  
executed by said processing apparatus by executing a multivariate analysis  
based upon the operation data and the processing result data;

calculating a predictive value predicting the result based upon the correlation by  
using operation data obtained by processing a workpiece other than the  
workpiece for which the correlation has been ascertained;

comparing said measurement value with the predictive value to determine an  
error in the measurement value relative to the predictive value;



~~engaging in said step in which the correlation is regenerated, said measuring~~  
~~apparatus is engaged in a self-diagnosis operation by said measuring~~  
~~apparatus~~ if the error in the measurement value indicating the processing  
results relative to the predictive value is equal to or greater than the  
predetermined value to determine if said measuring apparatus is error-free;  
and  
regenerating the correlation, if the error in the measurement value relative to the  
predictive value is judged to be equal to or greater than a predetermined  
value, is regenerated only if said measuring apparatus is judged to be error-  
free based upon the results of the self-diagnosis operation.

17. (Currently Amended) A method of process control according to claim ~~[[14]]~~16,  
wherein~~[[:]]~~ said multivariate analysis is executed by adopting a PLS method.

18.-26. (Canceled)

27. (Currently Amended) A method of process control executed by a control device  
installed in each area in a process control system having installed in each area at least  
one processing apparatus, at least one measuring unit provided at said processing  
apparatus, at least one measuring apparatus ~~capable of executing measurement~~  
~~processing on workpieces undergoing processing executed by said processing~~  
~~apparatus, a transfer apparatus that transfers the workpieces among apparatuses~~  
~~including said processing apparatus and said measuring apparatus~~ and said control

device that controls said processing apparatus, said measuring apparatus, and said transfer apparatus, the process control method comprising:

~~a step in which~~ executing measurement processing by said measuring unit on a  
workpiece processed by said processing apparatus ~~undergoes to obtain~~  
measurement results ~~measurement processing executed by said measuring~~  
~~unit;~~

~~a step in which~~ setting a processing condition ~~is set~~ for said processing  
apparatus based upon the results of the measurement processing executed  
by said measuring unit; and

~~a step in which~~ transferring a workpiece ~~is transferred~~ to said measuring  
apparatus by said transfer apparatus, ~~undergoes the~~  
executing a measurement processing ~~executed~~ by said measuring apparatus on  
the workpiece, and

setting the processing condition for said processing apparatus ~~is set~~ based upon  
the results of the measurement processing executed by said measuring  
apparatus while said measuring unit undergoes maintenance work.

28. (Currently Amended) A method of process control according to claim 27,  
wherein~~[[:]]~~ said measuring apparatus functions as a reference apparatus for said  
measuring unit of said processing apparatus ~~and checks~~ by checking on a regular basis  
whether or not there is any deviation of measurement results obtained by said  
measuring unit relative to measurement results obtained by said measuring apparatus  
or whether or not such a deviation is within an allowable range.

29. (Currently Amended) A method of process control according to claim 27, further comprising wherein:

preparing said measuring apparatus is utilized to prepare measurement  
processing information, by said measuring apparatus, that is required by said  
measuring unit of said processing apparatus to execute the measurement  
processing; and  
executing said measuring unit executes the measurement processing by said  
measuring unit based upon said measurement processing information.

30. (Currently Amended) A method of process control according to claim 27,  
wherein~~[[:]]~~ said measurement processing information includes, ~~at least,~~ coordinate  
information used to set coordinates specifying a measurement point on the workpiece.

31. (Currently Amended) A method of process control according to claim 27,  
wherein~~[[:]]~~ an object of measurement executed by said measuring apparatus and said  
measuring unit of said processing apparatus is the film thickness of a film formed on the  
workpiece.

32. (Currently Amended) A method of process control according to claim 27, wherein an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is a deposit present on the workpiece.

33. (Currently Amended) A method of process control according to claim 27, wherein an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is the width of a pattern formed on the workpiece.

34. (Currently Amended) A method of process control according to claim 27, wherein an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is defects present on the workpiece.

35. (Currently Amended) A method of process control according to claim 27, wherein an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is an overlay of patterns formed on the workpiece.

36. (Canceled)

37. (Currently Amended) A process control system that controls processing executed on workpieces by at least one processing apparatus installed in each area in a factory and having a processing chamber in which the processing is executed on the

workpieces[[]], a measuring unit that executes measurement processing on a workpiece before and after the processing is executed on the workpiece in said processing chamber, or either before or after the processing is executed on the workpiece in said processing chamber[[]], and a means for in-apparatus transfer capable of transferring the workpiece at least between said processing chamber and said measuring unit, the process control system comprising:

at least one measuring apparatus installed in each area and capable of executing measurement processing on workpieces undergoing the processing within the area and including a means for self-diagnosis that executes a diagnosis to determine whether or not an abnormality has occurred in said measuring apparatus;

a transfer apparatus installed in the corresponding area to transfer the workpieces among apparatuses within the area including said processing apparatus and said measuring apparatus; and

a control device installed in the corresponding area to control said processing apparatus, said measuring apparatus, and said transfer apparatus in the area,

to generate a correlation between operation data and processing result data ,  
by executing a multivariate analysis based upon the operation data related  
to an operation of said processing apparatus and the processing result  
data indicating the results of the processing executed by said processing  
apparatus,

to obtain a predictive value that predicts the processing results based upon  
the correlation by using operation data obtained through processing  
executed on a workpiece other than the workpiece for which the  
correlation has been generated,  
to engage said means for self-diagnosis at said measuring apparatus to  
execute a self-diagnosis if an error in the measurement value indicating  
the processing results relative to the predictive value is judged to be equal  
to or greater than a predetermined value,  
to regenerate the correlation only if said measuring apparatus is determined  
to be error-free based upon the results of the self-diagnosis, and wherein:  
~~said control device implements control on said processing apparatus, said~~  
~~measuring apparatus and said transfer apparatus so as to engage the~~  
measuring unit of another processing apparatus to execute the measuring  
processing on a workpiece undergoing the processing executed by a  
given processing apparatus if the measuring unit of the given processing  
apparatus is not available for use, wherein said measurement value  
indicating the processing result is the measurement value that is  
measured by the measuring unit of another processing apparatus.